

CHAPTER 13 SPRAYED FIRE-RESISTANT MATERIALS

SICC-1301 GENERAL

SICC-1301.1 Scope. The requirements of this chapter and NCSBC-1704.11 shall apply for all sprayed fire-resistant materials used to provide required fire resistance ratings for structural elements and decks. Sprayed fire-resistant materials shall not be applied to building elements until required inspections of the building elements and connections have been conducted and approved. Sprayed fire-resistant materials shall be applied, inspected and approved before attachment of or concealment by, other elements of the building.

The **SIER** shall inspect and test sprayed fire-resistant materials, including preparation of structural member surfaces, verification of substrate ambient temperatures and ventilation requirements, and testing samples for thickness, density and adhesion.

SICC-1302 DESIGN DOCUMENTS

SICC-1302.1 Construction documents. Designs for sprayed fire-resistant materials shall be listed by UL or other nationally recognized third party testing agencies to provide the required fire-resistance rating for structural elements and decks. The fire-resistance designs shall be designated on the County approved construction documents. The GC shall provide copies of the UL listings in the field for use by the **SIER**.

SICC-1303 INSPECTION AND TESTING

SICC-1303.1 Inspections and tests. The **SIER** shall inspect and test sprayed fire-resistant materials to verify compliance with NCSBC-1704.11 and the following:

SICC-1303.1.1 Building elements and connections. In addition to other required inspections of the building elements and connections, inspections shall include any non-standard design features or devices as shown on the County approved fabrication and erection documents for sprayed fire-resistant materials (see SIC-1402.2). Other building elements such as pre-cast concrete spandrel panels, electrical conduits, mechanical ductwork or metal studs shall not be installed that interfere with the application of sprayed fire-resistant materials.

SICC-1303.1.2 Application. Sprayed fire-resistant materials shall not be applied to building elements until the **SIER** required inspections of the building elements and connections have been conducted and approved. The sprayed fire-resistant materials shall be applied to all surfaces and lengths of members such that the continuity of fire-resistance required by the County approved fire-resistive designs is obtained.

SICC-1303.1.3 Sampling and testing.

SICC-1303.1.3.1 Thickness and density. Sampling and testing shall be in accordance with NCSBC-1704.11.3 and NCSBC-1704.11.4 and ASTM E 605, at least once for each 1,000 square feet (93 m²) of sprayed area for floors, roofs and walls and 25 per cent of the structural members on each floor.

SICC-1303.1.3.2 Adhesion. Sampling and testing shall be in accordance with NCSBC-1704.11.5 and ASTM E 736, at least once for each 10,000 square feet (929 m²) of sprayed area for floors, roofs and walls and one of each type of structural member per 10,000 square feet (929 m²) on each floor.

SICC-1303.1.4 Attachment of other elements. Sprayed fire-resistant materials shall be inspected and

approved before attachment of other elements of the building. Sprayed fire-resistant materials shall not be scraped off or removed to attach other building elements. Prior to concealment, sprayed fire-resistant materials shall be inspected and approved after attachment of other elements of the building. Any sprayed fire-resistant material damaged, scraped off, or removed shall be repaired.

NCSBC-1704.11 Sprayed fire-resistant materials. Special inspections for sprayed fire-resistant materials applied to structural elements and decks shall be in accordance with Sections 1704.11.1 through 1704.11.5. Special inspections shall be based on the fire-resistance design as designated in the approved construction documents.

NCSBC-1704.11.1 Structural member surface conditions. The surfaces shall be prepared in accordance with the approved fire-resistance design and the approved manufacturer's written instructions. The prepared surface of structural members to be sprayed shall be inspected before the application of the sprayed fire-resistant material.

NCSBC-1704.11.2 Application. The substrate shall have a minimum ambient temperature before and after application as specified in the approved manufacturer's written instructions. The area for application shall be ventilated during and after application as required by the approved manufacturer's written instructions.

NCSBC-1704.11.3 Thickness. The average thickness of the sprayed fire-resistant materials applied to structural elements shall not be less than the thickness required by the approved fire-resistance design. Individual measured thickness, which exceeds the thickness specified in a design by $\frac{1}{4}$ inch (6.4 mm) or more shall be recorded as the thickness specified in the design plus $\frac{1}{4}$ inch (6.4 mm). For design thicknesses 1 inch (25 mm) or greater, the minimum allowable individual thickness shall be the design thickness minus $\frac{1}{4}$ inch (6.4 mm). For design thicknesses less than 1 inch (25 mm), the minimum allowable individual thickness shall be the design thickness minus 25 percent. Thickness shall be determined in accordance with ASTM E 605. Samples of the sprayed fire-resistant materials shall be selected in accordance with Sections 1704.11.3.1 and 1704.11.3.2.

NCSBC-1704.11.3.1 Floor, roof and wall assemblies. The thickness of the sprayed fire-resistant material applied to floor, roof and wall assemblies shall be determined in accordance with ASTM E 605, taking the average of not less than four measurements for each 1,000 square feet (93 m²) of the sprayed area on each floor or part thereof.

NCSBC-1704.11.3.2 Structural framing members. The thickness of the sprayed fire-resistant material applied to structural members shall be determined in accordance with ASTM E 605. Thickness testing shall be performed on not less than 25 percent of the structural members on each floor.

NCSBC-1704.11.4 Density. The density of the sprayed fire-resistant material shall not be less than the density specified in the approved fire-resistant design. Density of the sprayed fire-resistant material shall be determined in accordance with ASTM E 605.

NCSBC-1704.11.5 Bond strength. The cohesive/adhesive bond strength of the cured sprayed fire-resistant material applied to structural elements shall not be less than 150 pounds per square foot (7.18 kN/m²). The cohesive/adhesive bond strength shall be determined in accordance with the field test specified in ASTM E 736 by testing in-place samples of the sprayed fire-resistant material selected in accordance with Sections 1704.11.5.1 and 1704.11.5.2.

NCSBC-1704.11.5.1 Floor, roof and wall assemblies. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from each floor, roof and wall assembly at the rate of not less than one sample for every 10,000 square feet

(929 m²) or part thereof of the sprayed area in each story.

NCSBC-1704.11.5.2 Structural framing members. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from beams, girders, joists, trusses and columns at the rate of not less than one sample for each type of structural framing member for each 10,000 square feet (929 m²) of floor area or part thereof in each story.

SICC-1304 COMPLETION OF SPRAYED FIRE-RESISTANT MATERIALS

Upon completion of sprayed fire-resistant material construction, the **SIER** shall, after review and approval by the **AR** and **SER**, submit a completion letter to **CCBSD**. The **SIER** shall also indicate the date of completion on the final report of special inspections for sprayed fire resistance materials.

Spray-Applied Fire Resistant Material (Council of American Structural Engineer's Guide)

Item	Scope
1. Material Specifications	
2. Laboratory Tested Fire Resistance Design	<i>Review UL fire resistive design for each rated beam, column, or assembly.</i>
3. Schedule of Thickness	<i>Review approved thickness schedule.</i>
4. Surface Preparation	<i>Inspect surface preparation of steel prior to application of fireproofing</i>
5. Application	<i>Inspect application of fireproofing.</i>
6. Curing and Ambient Condition	<i>Verify ambient air temperature and ventilation is suitable for application and curing of fireproofing.</i>
7. Thickness	<i>Test thickness of fireproofing (ASTM E605). Perform a set of thickness measurements for every 1,000 SF of floor and roof assemblies and on not less than 25% of rated beams and columns.</i>
8. Density	<i>Test the density of fireproofing material (ASTM E605).</i>
9. Bond Strength	<i>Test the cohesive/adhesive bond strength of fireproofing ASTM E736). Perform not less than one test for each 10,000 SF.</i>
10. Other:	